

Lord Rayleigh's problem.<sup>1</sup> He showed that, in a certain case in which the analytical solution leads to an infinite value, there are waves in the continuous streams in diametrically opposite phases, and that the vortical stratum consists of a series of oval vortices. The uniform current flowing over existing ripple-mark exhibits almost a realisation of this mode of motion, one of the streams of fluid being replaced by the sandy undulations. The same kind of motion must exist in air when a gust of wind blows a shallow puddle into standing ripples.

It seems probable that what is called a mackerel sky is an evidence of a mode of motion also closely similar to that described by Sir William Thomson. M. de Candolle's suggestion that cirrus is aerial ripple-mark may then be regarded as substantially correct.

If two horizontal currents of fluid exist one above the other, the layer of transition from one to the other is dynamically unstable, but it is probable that if a series of vortices be interpolated, so as to form friction rollers as it were, it becomes stable. It is likely that in air a mode of motion would be set up by friction, which in frictionless fluid would be stable.

The formation of clouds is probably due to the saturation with moisture of one current and the coldness of the other.

The direction of striation and velocity of translation of mackerel clouds require consideration according to this theory.

It appears that if a mackerel sky be formed between two aerial currents, the striations are parallel to that direction in which the two currents have equal component velocities, and the component velocity of the clouds parallel to the striations is equal to the component velocity of either current in the same direction.

The resultant velocity of the clouds is equal to a half of the resultant velocity of the two currents, and the component velocity of the striations perpendicular to themselves is the mean of the components of velocity of the two currents in the same direction.

The account which is given in this paper of the formation of ripple-marks shows it to be due to a complex arrangement of vortices. The difficulty of observation is considerable, and perhaps some of the conclusions arrived at may require modification. It is to be hoped that other experimenters may be induced to examine the question.

The reader is referred to the original for the figures, which are necessary to an adequate explanation of the phenomena and conclusions.

#### NOTE ON DEAFNESS IN WHITE CATS<sup>2</sup>

THIS curious occurrence has long been a matter of interest to me, originally because cats have always been very favourite pets in my household, and still more because the occurrence amongst them of deafness was used by Mr. Darwin in his first edition of "Animals and Plants under Domestication" as an illustration of correlated variability. He was under the impression that white cats with blue eyes were invariably deaf.

I had collected a number of observations which I had personally made, and I found that some white cats were deaf which had the ordinary yellow eyes, and that some white cats with blue eyes could hear perfectly well. I have never heard of deafness in any but a white cat, and all the deaf white cats I had personally examined were males. Therefore, in NATURE, 1873, I published a brief note pointing out Mr. Darwin's error. In his second edition Mr. Darwin established two cases of deafness in female white cats, so that the conclusions of both of us were upset, and this wholesale destruction of theories has been completed by the birth in one of my feline families of a white kitten, female, with perfectly yellow eyes, and absolutely deaf. She lived with us for two years, and her misfortune was quite permanent. My conclusions from the facts observed by myself now may be formulated in this way, that congenital deafness is not known to occur in any animal but the cat, though I am not quite sure but that one white mouse I had some years ago was deaf, and that no cats but those entirely white are ever deaf. As female cats are far more common than males (and this seems to be true of white cats as well as those of other colour), and as I have known only one deaf female cat for some twenty deaf males, I think I may assume that deafness is more common among males than among females. The colour of the

eyes has evidently nothing to do with the deafness, though it has with the colour of the fur, and seems to be dependent on the same process—an arrest of development. The eyes of nearly all kittens are blue for some weeks after birth, and the same cause which arrests the pigmentation of the fur arrests in a very much smaller number the pigmentary growth in the eye. I have been told of two cases of complete absence of pigment in the eyes of two cats (albinism) as is seen so commonly in rabbits, guinea-pigs, rats, and mice, but I have not been able properly to authenticate them. These cats were said to be not deaf.

In 1872 I obtained a cat from Hertfordshire as an example of the polydactylism which is very common there, and when he arrived I found that he was white, that he had one eye a bright blue and the other a bright yellow, and that he was profoundly deaf. He was by far the most interesting cat I have ever possessed, and must be well remembered by many members of this Society who have favoured my house with their presence as "Old Pudge," possessed of all the feline virtues, and many of a more human type—and free from vice of every kind. He lived with us for eleven years, and died last winter of peritonitis. Whilst living with us we made many observations concerning his deafness, and I easily determined that it was purely tympanic—that is, he was deaf to impressions conveyed through the air, but his intelligence could be reached by impressions conveyed through solid media. When I wanted him to come to me I gave a peculiar sharp stamp on the floor, and he immediately responded to the signal, even if he was on a chair or table. It is very remarkable that this congenital deafness is in no way associated in the cat with mutism. Human deaf-mutes generally are those in whom deafness is cochlear as well as tympanic, and the result of such disease as scarlet fever in very early life. One other peculiarity he had is that for about four years he suffered from occasional fits of epilepsy of a very severe kind. They came on always during his sleep, and for their first indication had the painful peculiarity that the cat seized the tip of his tail and bit it off, and in this way his tail was shortened considerably. Every kind of white animal I have kept as a pet has been the subject of epilepsy, and the association is suggestive when we are told, as I have been frequently, that the disease is unknown amongst negroes.

I sent the body of my old cat to Prof. Flower for the purpose of having an investigation made into the cause of his deafness. Prof. Flower had a most careful investigation of the condition of his ears made by two most competent investigators—Dr. Cumberbatch and Dr. Heneage Gibbs. The result, briefly stated, is that all the structures in the ears were normal save the tympanic membranes, in which there were triangular gaps extending from the roof to just below the centre, the bases of the gaps being directed upwards, and their anterior side being formed by the handles of the mallei. The gaps appeared to be congenital, and were quite symmetrical; all the other apparatus of the ears was normal, and the auditory nerves were of normal size and structure.

The only congenital defect known in the human tympanum is a very minute aperture, of rare occurrence, and due to the patency of the fissure of Rivinus. The tympanic deficiency in the white cat seems to be in no way associated with this form of arrest.

The results of the observation are interesting, though the subject may perhaps be regarded as trivial, as by it the point raised by Mr. Darwin is finally established. It really is a case, and a very well marked one, of correlated variability, and its great interest is that the three structures affected—the fur, the iris, and the tympanic membrane—have a common origin from the epiblast. Had the defects observed in this cat been cochlear, the difficulty of understanding them would have been very great, as the structures of the internal ear arise from the mesoblast, according to Balfour.

LAWSON TAIT

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The recent recommendations of the General Board of Studies have all been passed. These include the appointment of a Professor of Pathology next term, of Readers in several subjects, including Comparative Philology and Botany, of University Lecturers in connection with Special Boards, including Medicine (four), Mathematics (five), Biology and Geology (six), History and Archæology (five), Moral Science (one),

<sup>1</sup> NATURE, November 11, 1880, pp. 45-46, and see correction on p. 70.

<sup>2</sup> Read before the Birmingham Philosophical Society, October 11.

and of a number of Demonstrators and Assistants. Plans for new buildings for Comparative Anatomy, Botany, and Mechanism are to be obtained.

Dr. Besant will lecture on Analysis (Schedules II. and III.) during two terms; Mr. Pendlebury on Analytical Optics, next term, and on Laplace's and Bessel's Functions in the Easter Term; Mr. Webb on Elementary Rigid Dynamics in the Easter Term, and on Higher Dynamics in the Long Vacation.

Inasmuch as the University Table at the Naples Zoological Station has been constantly occupied by students of animal morphology, and there are students in physiology and botany for whom study at Naples is very desirable, it is proposed to extend the advantages of study to students of biology generally. Dr. Dohrn has unofficially expressed his willingness to receive, when desired, two members of the University at a time for a payment of 100*l.* instead of 75*l.* a year.

It is hoped that the new Biological and Physical Laboratory, connected with Newnham College, which is being fitted up in Downing Place, may be ready for use by the beginning of next term. The nearness of the site to the new museums will enable students of Newnham to attend professors' lectures there and carry out practical study at the laboratory with the least possible loss of time.

With regard to the statement made last week that "St. John's does not as yet open any of its advanced lectures to other than its own students," we are informed that the advanced lectures have for a long time been open to members of the University, and lectures are provided in some subjects not lectured on elsewhere. The sentence in the report was to the effect that the list for next year was not yet issued. It has now appeared, and no less than six courses of open lectures are announced for the remainder of the academical year.

**NEW ZEALAND.**—The Queen has been pleased to direct Supplementary Letters Patent to be passed under the Great Seal granting and declaring that the Degrees of Bachelor and Doctor in Science granted or conferred by the University of New Zealand shall be recognised as Academic distinctions and rewards of merit, and be entitled to rank, precedence, and consideration in the United Kingdom and in the Colonies and Possessions of the Crown throughout the world, as freely as if the said Degrees had been conferred by any University of the United Kingdom.

### SCIENTIFIC SERIALS

*The American Naturalist* for November, 1883, contains:—The Pre-cambrian rocks of the Alps, by T. Sterry Hunt.—The achenial hairs of *Townsendia*, by G. Macloskie.—The hibernacula of herbs, by Aug. J. Foerste.—The hair-sac mite of the pig, by Prof. R. Ramsay Wright.—The geology of Central Australia, by Edward B. Sanger.—The number of segments in the head of winged insects, by A. S. Packard, jun.

*Gegenbaur's Morphologisches Jahrbuch*, Bd. ix., Heft 1, contains:—Researches on marine Rhipidoglossa, by Dr. Béla Haller, No. 1 (plates 1 to 7).—On developmental relationships between the spinal marrow and the spinal canal, by Dr. W. Pfützer.—Contribution to the comparative anatomy of the posterior limbs in fishes, part 3, *Ceratodus*, by Dr. M. Davidoff (plates 8, 9).—On some anatomical marks of distinction between the house dog and the wolf, by Prof. H. Landois.

*Rivista Scientifico-Industriale*, October 23, 1883.—On the influence of static electricity on the needle, by Prof. Michela Cagnassi.—Experiments with the radiometer (continued), by Prof. Constantino Rovelli.—On the conditions which determine the least and greatest deviation of a ray passing through a prism, by Prof. G. Buzzolini.—On the employment of coppers in testing iodides blended with alcoholic bromides and chlorides, by Dr. Alfredo Cavazzi.—On the advantages that may be derived by medical jurisprudence from entomological studies, especially in determining the approximate date and cause of death, by P. Megnin.—Note on the *Titanophasma fayoli*, a new fossil insect found in the carboniferous formations of Commeny, Allier, by the Editor.

### SOCIETIES AND ACADEMIES LONDON

Royal Society, November 15.—"On *Sceparnodon ramsayi*," a fossil mammal from Australian Pleistocene deposits, by Prof.

Owen. The first indication of this species was transmitted to the author, in 1881, in the form of casts of detached teeth, all representing an anterior incisor, the most entire specimen being 5½ inches in length, 35 mm. in breadth, with uniform thickness of 8 mm., the tooth, slightly curved, with persistent pulp-cavity at the base, and a sharp chisel-shaped cutting margin at the opposite end. The author deferred notice of this indication in hope of receiving a specimen of the tooth itself. This was needed in order to make the requisite microscopical researches as to structure, the wombat and some small rodents alone possessing, in Australia, ever-growing scalpriform incisors, but markedly differing in shape as well as size from the fossil. Prof. Owen was favoured by receiving, in the present year, from the bed of King's Creek, Queensland, a tooth, identical in character with the cast, and the present paper records the results of his scrutiny of structure. They led to the conclusion of the former existence in Australia of a mammal with rodent upper incisors, as in the wombat, but of distinct shape, and indicative of a species as large as a tapir. The microscopic characters of both dentine and enamel weighed in favour of the marsupial affinities of *Sceparnodon*. The author referred to the fact that the first indication of the genus *Thylacoleo* was a single carnassial tooth submitted to him in 1833 by Sir Thomas Mitchell, and a similar evidence of *Diprotodon* was an incisor brought by the same explorer from the caves he had discovered in the district named, after the Colonel's old commander, "Wellington Valley."

At the same meeting Prof. Owen gave a minute description of a fossil humerus which had been transmitted to him by Mr. Ramsay, F.L.S., who had discovered it in the breccia cave in "Wellington Valley." The bone was partially mutilated, but gave sufficient evidence of its having come from a Monotreme, with so close a conformity, save in size, with that of the existing *Echidna hyotrix*, as to lead to its reference to an extinct species of that genus. It, however, far surpassed it in size, exceeding, as it did, the corresponding bone in the larger Monotrematous ant-eaters which have been found living in New Guinea. Drawings of the subjects of both papers accompanied the text.

**Geological Society, November 21.**—J. W. Hulke, F.R.S., president, in the chair.—The following communications were read:—On the skull and dentition of a Triassic mammal (*Tritylodon longævus*, Ow.) from South Africa, by Prof. Owen, C.B., F.R.S. The specimen described in this paper formed part of a collection containing remains of some of the known South-African Triassic reptilian genera, and agreed with them in its mode of fossilisation. It was submitted to the author by Dr. Exton, of Bloemfontein. The specimen is a nearly entire skull, wanting only the hinder part, and it measures about 3½ inches in length, from the broken end of the parietal crest to the point of the united premaxillaries. The upper surface shows the ankylosed calvarial portions of the parietals, and the frontal bones divided by a suture; the contiguous angles of these four bones are cut off, so as to leave an aperture, occupied by matrix, which may be a fontanelle, or a pineal or parietal foramen. The frontals form the upper borders of the orbits, which are bounded in front by the lacrymal and malar bones, and were not completed behind by bone. Each frontal is narrowed to a point at the suture between the nasal and maxillary. The nasals are narrow, but widen in front to form the upper border of the exterior nostril, which is terminal, and is completed by the premaxillaries. The maxillaries are widened posteriorly, then constricted, and again widened before their junction with the intermaxillaries. The teeth include a pair of large round incisors, broken off close to the sockets and showing a large pulp-cavity, surrounded by a complete ring of dentine, which is covered by a thin coat of enamel on the front and sides. At 2 mm. behind each of these teeth is the socket of a smaller premaxillary tooth; this tooth apparently had a thin wall and a pulp-cavity relatively larger than in the anterior tooth. It is separated by a ridged diastema from the series of six molar teeth on each side, the first of which has a sub-triangular crown with the base applied to the second tooth. The latter and the four following teeth are nearly similar, subquadrate in form, with the crowns "impressed by a pair of antero-posterior grooves, dividing the grinding surface into three similarly disposed ridges, and each ridge is subdivided by cross notches into tubercles." Of these there are, in the second to the fourth molar inclusive, four tubercles on the mid-ridge, three on the inner ridge, and two on the outer ridge." The author discussed the relations of this new form of mammal, especially as indicated by the structure of the teeth, which he showed to resemble those of *Microlestes*, from